

Screen Readers and SciEng Interfaces – how accessible is database content

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Print Impaired

- Blind
- Visually impaired
- Learning / reading disabilities
- Dyslexia
- Cognitive impairment

Texas A&M University – Students requesting accommodation

- Deaf/Blind: 1 fall 2017 / 2 fall 2018
- Learning: 923 fall 2017 / 905 fall 2018
- Visual/Blind: 91 fall 2017 / 59 fall 2018

- Source: Texas A&M University. Disability Services
- <file:///C:/Users/jstephens/Documents/My%20Research/Disabilities%20Libraries/STEM%20conference%20Austin%20Jyuly%202019/Statistics%20-%20Disability%20Services%20TAMU%20trying%20html.html>

National Science Foundation Digest

- 19.5% UG reported having a disability
 - 28% of UG with disabilities enrolled in STEM
- 10% employed S or E report 1 or more disabilities
- 1998 to 2017, person with disabilities in academic careers increase 9%
 - ~8% (doctorial academic workforce)

Source: Women, Minorities, and Persons with disabilities in Science & Engineering 2019
National Science Foundation, biennial Report / Digest
<https://ncses.nsf.gov/pubs/nsf19304/>

Compliance, accessibility, usability, friendly

- **Library databases are legally compliant (Stewart)**
- **Web based products can be legally compliant, but not screen reader friendly (Stewart & Mulliken)**
- **One element of accessibility: Used “independently of sight and human assistance”(Mulliken)**
- **Most students are not screen reader experts (Muliken & Stewart)**
- **Work independently, or with librarians who would provide visual clues & who are screen reader familiar (Muliken)**

- Mulliken, D. (2017). There is Nothing Inherently Mysterious about Assistive Technology: A Qualitative Study about Blind User Experiences in US Academic Libraries. *Reference & User Services Quarterly*, 57(2), 115-126.
doi:10.5860/rusq.57.2.6528
- Stewart, R., Narenda, V., & Schmetzke, A. (2005). Accessibility and usability of online library databases. *Library Hi Tech*, 23(2), 265-286.
doi:10.1108/07378830510605205

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JAWS – navigate interfaces – common JAWS commands...

- Web page commands
 - E enter navigates to an edit box
 - Movement – H goes to header, E, edit box, T table, C combo box, R, by region, Q main region, B, button, X check box, O article, L to unnumbered lists, etc.
 - INS F3 lists all html features (buttons, links, headers, articles, regions, etc.
 - INS F 7 all links on page; INS F6 headings
 - INS CRTL R list of all regions on a page

ARIA – landmarks – enhance accessibility

- Used to identify structure & organization
 - Role for each area/section of a page
- Enable screen readers to navigate
- Semantically meaningful labels – to the user, not the developer
- Rules

- [WAI ARIA Authoring Practices 1.1](#)
- <https://www.w3.org/TR/wai-aria-practices-1.1/#html5-sectioning-elements>

Regions, headings, Lists, Combo boxes, Buttons, Links. Search page / results page

Element	EV	WOS	ACM new	IEEE
Regions	4/5+	1/3	3/3+	0/12
Heading	4/43	3/11	34/43	8/42
Lists	7 (26) / 21 (70)	6 (28) / 10 (28)	37 (144) / 111 (64)	14 (50) / 36 (153)
Combo	8/8	3/1	8?/0	7/1
Buttons	11/71	1/14	74/8	2/9
Links	32/252	33/88	364/204	41/268

Inconsistencies

Item	EnViil	WOS	ACM new	IEEE	Acc Eng	Scopus
Search page	Main region	H4 =date Tab or C	Region s	H1 H2 Cs	Edit box	Region
Refine – results page	Region H3 H4	H3 H4	Main region H4	Main region H1s	Region H2s	H2s
Result s list	H3 SR region	Links (not list),	H5	H2	Articles H2s	Table

Landmarks / regions - lack semantically meaningful labels

1. Banner
 2. Navigation
 3. Content information
 4. Main
 5. Complementary information
- IEEE results – all go to refine/filter section.
 - Main → Search w/in results; rest named “banner” → refines options (author, affiliation, etc.)

Issues

- Page sections are unclear, difficult to navigate
- Meaningful labels or tags are lacking
- Icons, edit boxes, +-, etc.
 - distracting information difficult to skip
- Visual clues misleading - something that looks like a combo box, should function like one.
- Lists (L) have no labels

ACM end of citation

“ 4 ↗ 127 | A Highlights ∨



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Advanced Search Options

[Advanced Keyword/Phrases](#)[Command Search](#)[Citation Search](#)[Preferences](#)

ENTER KEYWORDS OR PHRASES, SELECT FIELDS, AND SELECT OPERATORS

Note: Refresh page to reflect updated preferences.

Search : ☒ Metadata Only ☐ Full Text & Metadata [?](#)

in ▾in ▾in

ACM new interface

Journals Magazines Proceedings Books SIGs Conferences

← Navigation
region

Search ACM Digital Library



Search



Moving image – very distracting
Slide shows

Search by Subject

Artificial Intelligence, Mac

Possible solutions

- Develop consistent practices
 - Headers
 - Page sections / regions
- Add meaningful labels/tags
- Eliminate extraneous wording
- Developers should test their work using screen readers – preferably blindfolded.
- A lot more usability testing - with diverse group of print impaired
- Options for getting help

Questions?